BUREAU OF RESEARCH

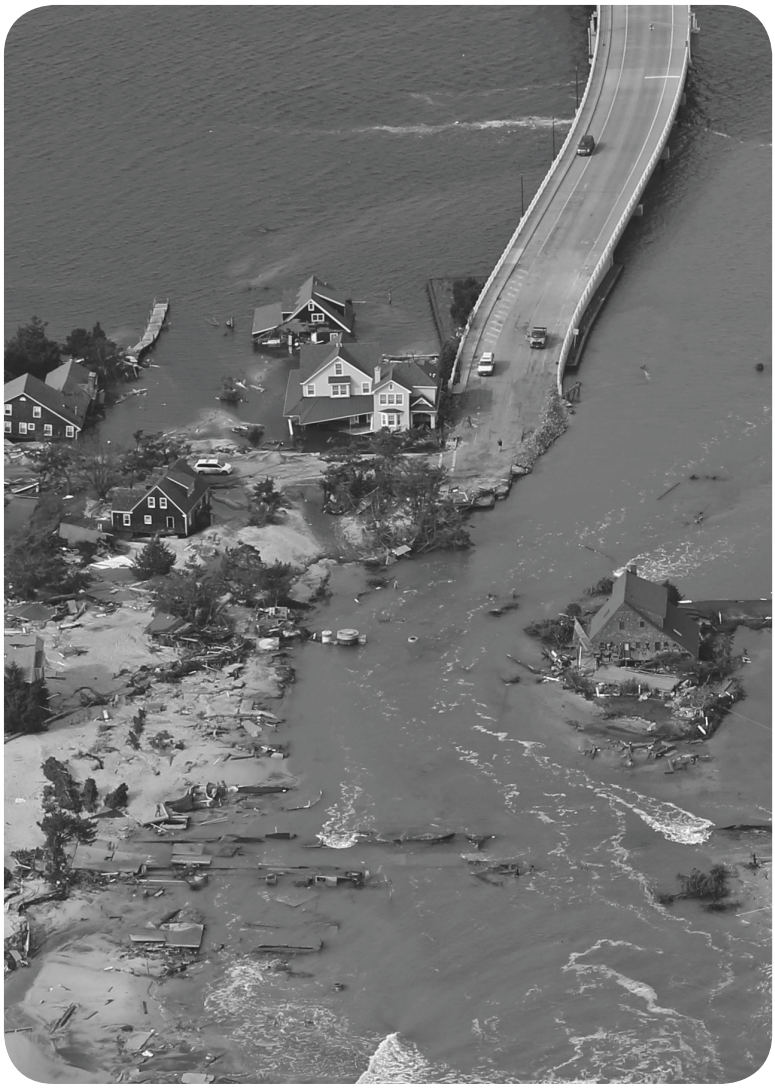
Innovation and Resiliency: Infrastructure Recovery

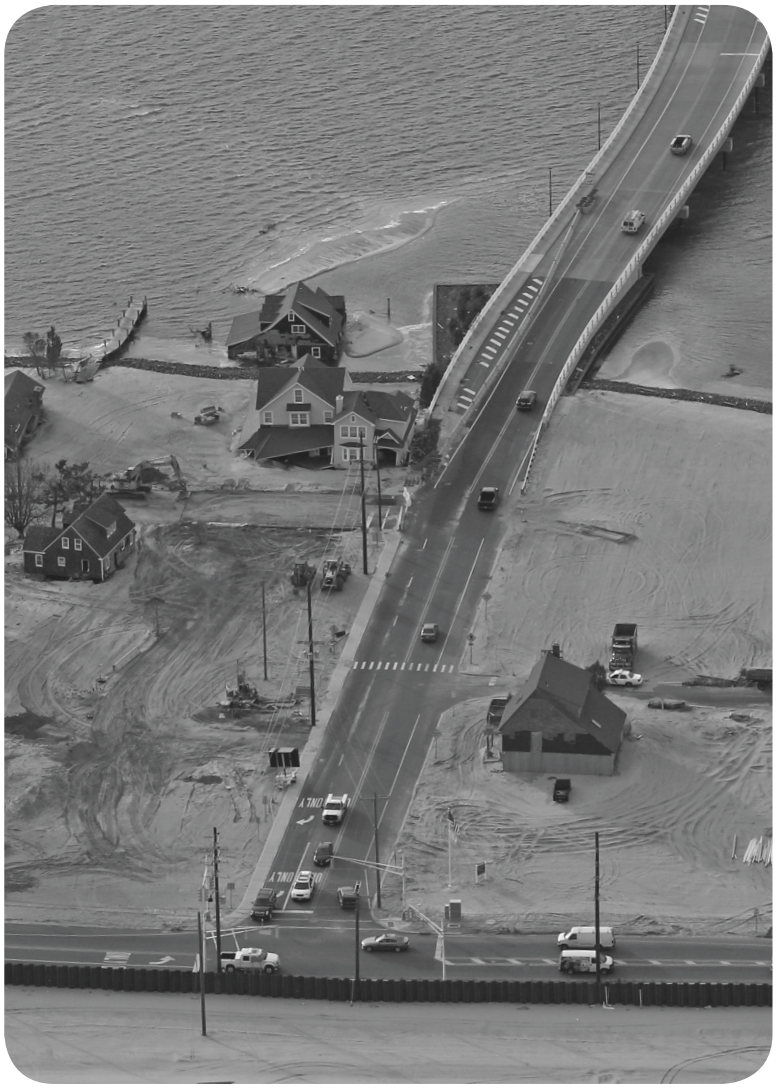
OCTOBER 23, 2013

The Conference Center at Mercer
1200 Old Trenton Road
West Windsor, NJ 08550

15TH ANNUAL NJDOT

RESEARCH SHOWCASE





15TH ANNUAL NJDOT RESEARCH SHOWCASE AGENDA

The **15th Annual NJDOT Research Showcase** is an opportunity for constituents of the New Jersey Department of Transportation (NJDOT) to experience the broad scope of ongoing research initiatives, technology transfer activities, and academic research being conducted by research partners and their associates. This program is hosted by the New Jersey Local Technical Assistance Program (NJ LTAP) at Rutgers' Center for Advanced Infrastructure and Transportation (CAIT) and meets requirements for up to 3.5 PDHs for continuing professional competency for licensed professional engineers. *

8:00 a.m. **Poster Session**
Room 116 and Room 117

9:00 a.m. **Opening Remarks**
Auditorium

David Kuhn, P.E.
Assistant Commissioner, Capital Investment, Planning and Grant Administration, NJDOT
Lawrence F. Cullari Jr., P.P.
Assistant Division Administrator, Federal Highway Administration–New Jersey Division (FHWA)

9:15 a.m. **Keynote Address: Second Strategic Highway Research Program (SHRP2)–Status, Outcomes, Strategies, and Tactics**
Auditorium

Jerry A. DiMaggio, P.E.
SHRP2 Implementation Coordinator, Transportation Research Board (TRB)
Amy Lucero, P.E.
Director of Technical Services, FHWA

10:15 a.m. **Networking Poster Session and Break**
Room 116 and Room 117

10:45 a.m. **Panel Discussion: Innovation and Resiliency–Infrastructure Recovery**
Auditorium

James Bryant, Ph.D., P.E.
Maintenance and Preservation Engineer, TRB Technical Activities Division
Jie Gong, Ph.D.
Rutgers' CAIT
Lazar Spasovic, Ph.D.
New Jersey Institute of Technology

11:30 a.m. **Presentation of Outstanding Student in Transportation Award, NJDOT Research Implementation Award, and Best Poster**
Presented by: Paul Thomas
Project Engineer, NJDOT, Bureau of Research

12:00 p.m. **Buffet Lunch**

1:00 p.m. **Concurrent Breakout Sessions**

ENVIRONMENT

Room 213

Moderator: Priscilla Ukpah, NJDOT

1:00–1:35 p.m.
Field Observations of the Geotechnical Engineering Damage to the NJ Coast Due to Hurricane Sandy
Beena Sukamaran, Rowan
sukamaran@rowan.edu

1:40–2:15 p.m.
Life Cycle Assessment of Asphalt Pavement Preservation
Hao Wang, Ph.D., Rutgers' CAIT
hwang@cee.rutgers.edu

2:20–3:00 p.m.
FHWA Tri-State Hurricane Sandy Climate Adaptation and Resiliency Effort
Josh DeFlorio, Cambridge Systematics
jdeflorio@camsys.com

INFRASTRUCTURE

Auditorium

Moderator: Brian N. Tobin, Rutgers' CAIT

1:00–1:35 p.m.
Metrics and Performance Response Actions for Assessment of Resilience of Urban Infrastructure Systems
Anum Batool, University Transportation Research Center (UTRC)
ab523@njit.edu

1:40–2:15 p.m.
State of the Art Practices of Mass Concrete
Andrès Roda, P.E., Rutgers' CAIT
aroda@rutgers.edu

2:20–3:00 p.m.
Development of Acceptance Criteria for Polymer Modified Binders for the State of New Jersey
Yusuf Mehta, Ph.D., Rowan University
mehta@rowan.edu

MOBILITY

Room 216

Moderator: Giri Venkiteela, NJDOT

1:00–1:35 p.m.
Impact of Freight on Highway Infrastructure in New Jersey
Hani Nassif, Ph.D., Rutgers' Infrastructure Monitoring and Evaluation (RIME)
nassif@rci.rutgers.edu

1:40–2:15 p.m.
Modeling ADA Paratransit Operations in New Jersey
Eric Gonzales, Ph.D., Rutgers' CAIT
eric.gonzales@rci.rutgers.edu

2:20–3:00 p.m.
Handheld Devices Project
Kaan Ozbay, Ph.D., Polytechnic Institute of New York University
kaan.ozbay@gmail.com

SAFETY

Room 214/215

Moderator: Daniel Lisanti, NJDOT

1:00–1:35 p.m.
Work Zone Safety Analysis
Hong Yang, New York University
yanghong@gmail.com

1:40–2:15 p.m.
Effectiviness of New Jersey's Graduated Driver's License Laws in Improving Driver Safety
Allison Daniello, Virginia Tech
adaniell@vt.edu

2:20–3:00 p.m.
Salem County Systemic Safety Project
Andy Kaplan, EIT, Rutgers' CAIT
akaplan@rutgers.edu

3:00 p.m. **ADJOURNMENT**

* To confirm the acceptance of these PDHs for continuing professional competency for licensed professional engineers, please consult the licensure board of that state.

Poster Session Exhibits

ENVIRONMENT
Room 116

Noise Related to Pavement Preservation Surfaces in New Jersey
Rutgers' CAIT

Rapid On-Site Waste Characterization Tool for Managing Paint Waste from Bridge Rehabilitation
NJIT

INFRASTRUCTURE
Room 116

Characterization of Fatigue Properties of Binders and Mastics
Rowan University

Development of Performance-Related Pay Adjustment for HMA Pavement
Rutgers' CAIT

Monitoring of the Highway Bridge Network Through Universal Parameters: The Neutral Axis
Princeton University

Cohesion, Fracture, and the Vialit Cohesion Pendulum as a Tool for Asphalt
Rutgers' CAIT

Evaluation of Surface Resitivity Indication of Ability of Concrete to Resist Chloride Ion Penetration
Rutgers' RIME

Alternatives to Nuclear Density Testing
Rowan University

Predicting Construction Project Cost Increases Using Text and Data Mining
Rutgers' CAIT

MOBILITY
Room 117

Elimination of Weight Restriction on Amtrak, NJ Transit, and Conrail Lines
Rutgers' RIME

Impact of Rail Grant Program
Rutgers' RIME

Impact of Freight on Highway Infrastructure in New Jersey
Rutgers' RIME

Implementing the VISTA DTA for Environmental Analysis in Nicosia, Cyprus under the REDUCTION European Commission Sponsored Project
City University of New York (CUNY)

Implementing the VISTA DTA model to Evaluate the Locaton of VMS in New Jersey
CUNY

An Integrated Transportation Planning and Operations Model for Memphis, TN
CUNY

Portable Data Collection Systems for Truck Monitoring Program
Rutgers' RIME

NJDOT State-Wide Large Truck Monitoring Program: Data Collection, Processing, and Reporting
Rutgers' RIME

Optimal Locations for RWIS Sites Considering Traffic and Regional Weather Conditions
NJIT

SAFETY
Room 117

Plan4Safety: Online Crash Analysis Software
Rutgers' CAIT

Road Safety Audits
Rutgers' CAIT

James W. Bryant, Jr., Ph.D., P.E. serves as the Maintenance and Preservation Engineer and the Research Staff Representative for the Technical Activities Division of the Transportation Research Board in Washington, DC. Dr. Bryant also serves as the lead TRB staff in the areas of Research and Education. For the past six years, he was the lead staff for the Renewal focus area of the Strategic Highway Research Program 2 (SHRP 2), where he directed the $37 million applied research program focused on the maintenance, rehabilitation and construction of transportation infrastructure. He is now transitioning from the Renewal focus area to Maintenance and Preservation. Prior to TRB he worked in the area of maintenance and operations in both the private and public sectors. His public sector experience was with the Virginia Department of Transportation, and also at the Virginia Center for Transportation, Innovation, and Research. Dr. Bryant earned a master's of science and a doctorate in civil engineering in 1999 and 2001, respectively, from the department of civil and environmental engineering at Virginia Tech. He received a bachelor's of science in civil engineering from North Carolina Agricultural and Technical State University in 1996. He is a registered professional engineer in the Commonwealth of Virginia, and a member of the American Society of Civil Engineers.

Lawrence Cullari Jr., P.P. is the assistant division administrator for the New Jersey Division of the Federal Highway Administration (FHWA). As chief operating officer for the division, he is responsible for managing the 11th largest Federal-aid program in the country, totaling approximately $1 billion per year. Mr. Cullari was appointed to this position in 2009, and supervises 25 professional engineers, planners, finance specialists, environmental specialists, civil rights and administrative specialists. He joined the FHWA in 1996, and has held positions in planning, research, finance and asset management. Mr. Cullari holds a bachelor of science degree in environmental planning and design from Rutgers, The State University of New Jersey, and a master's degree in business administration from The University of Pennsylvania.

Jerry A. DiMaggio, P.E. is the implementation coordinator for the Second Strategic Highway Research Program (SHRP2) at the Transportation Research Board, The National Academies. His advanced degrees and expertise are in underground design, construction and monitoring. Mr. DiMaggio is a recognized authority on limit states design (LRFD), risk management, innovative contracting and accelerated construction. He is the retired principal bridge engineer and national geotechnical/ foundation engineering program manager with the Federal Highway Administration (FHWA). A registered professional engineer in several states, a certified master trainer and a licensed contract arbitrator (AAA), Mr. DiMaggio has provided consulting services on approximately 1,000 civil construction projects in all 50 states, throughout Central and South America, several Middle Eastern countries and Australia, and has presented over 350 seminars, workshops and webinars.

Mr. DiMaggio has been a member of the adjunct faculty at four nationally recognized universities and has authored numerous technical papers and edited three civil engineering books. He has received numerous recognitions and awards at a national and international level for his individual and career contributions to the civil and heavy construction communities. He holds a bachelor of science degree and a master of science degree in civil engineering from Clarkson University.

David Kuhn, P.E. is the assistant commissioner of the NJDOT Capital Investment, Planning and Grant Administration. He is responsible for management of the NJDOT's capital funds, administering grants to local government, non-profits and the private sector, and planning for future transportation investment to move people and goods effectively throughout the state. Mr. Kuhn has been leading the NJDOT's Asset Management Program, establishing performance metrics and improving the use of data to drive business decisions. He has a bachelor's degree in civil engineering from the University of Delaware and is a licensed professional engineer and a certified project management professional.

Amy C. Lucero, P.E., is the director of technical services at the Federal Highway Administration (FHWA). This office, started by Ms. Lucero in 2008, consists of over 200 employees and contract support and brings together the

FHWA Resource Center, the National Highway Institute and the Technology Partnership Programs. It assures a coordinated approach across the FHWA for developing and enhancing the transportation workforce through training, technical assistance, and technology deployment. Working with agency managers and partner agencies, the office helps define the developmental needs of the current and future workforce, and then initiates programs and efforts to address these needs. The administration of the 58 Local and Tribal Technical Assistance Program centers also resides in the office, as well as the Eisenhower Fellowship Program that provides grants each year to promising university students.

Ms. Lucero holds a master's degree in public administration from the University of Colorado, and a bachelor of science degree in civil engineering and a bachelor of arts degree in economics, both from the University of New Mexico. She is a registered professional engineer in the state of New Mexico.

Jie Gong, Ph.D., CM-BIM, is an assistant professor in the Department of Civil and Environmental Engineering at Rutgers, The State University of New Jersey. Prior to joining Rutgers, he was an assistant professor at Southern Illinois University from 2010 to 2012. He received his doctoral degree in civil engineering from The University of Texas at Austin in 2009, his master of science degree from Texas Tech University, and his bachelor of science degree from Shanghai Jiao Tong University. He spent three years working as a geotechnical engineer on projects ranging from tunneling to rapid public transit systems.

Dr. Gong's general research interest is in building and civil infrastructure engineering, particularly in the areas of remote sensing, structural forensics, building information modeling, data fusion and visualization, and pattern recognition. Dr. Gong's recent research focuses on integrating emerging technologies such as stationary/mobile LIDAR (Light Detection and Ranging), aerial imagery, vision sensors, wireless sensors, mobile computing devices, and thermography with computing methods such as data mining, statistical learning, computer vision, and cloud computing to support post-disaster response and recovery operations. Dr. Gong has been the principal investigator and co-principal investigator for research projects funded by the National Science Foundation, U.S. Department of Housing and Urban Development, U.S. Department of Transportation, the New Jersey Department of Transportation, and the Illinois Department of Transportation.

Recently, Dr. Gong led a remote sensing-based post-Sandy damage study on critical infrastructures and residential housings for much of the Superstorm Sandy-impacted areas in New Jersey and New York City. The study received great media coverage and has been highlighted in the USDOT Transportation Center monthly newsletter. The study also received the Distinguished Engineering Award from the New Jersey Alliance for Action. Dr. Gong is the recipient of the 2010 Best Paper Award of ASCE Journal of Computing in Civil Engineering.

Lazar N. Spasovic, Ph.D., is a professor of civil and environmental engineering at New Jersey Institute of Technology's Newark College of Engineering. He is a nationally recognized expert in transportation systems analysis, transportation planning, freight transportation operations and analysis, and business logistics. He has conducted pioneering studies in transportation planning and traffic modeling, mobility and congestion analysis, traffic safety, ITS, intermodal freight transportation, and brownfields redevelopment for freight-related uses. In his career, spanning over the last 25 years, Dr. Spasovic has worked both in the corporate and academic arenas, and has built a track record in funded research and scholarly activities.

He has more than 80 refereed journal and proceedings papers and professional presentations to his credit, and has served as principal investigator on more than $30 million of funded research. He is currently the program director for the FHWA-sponsored Transportation Economic and Land Use System (TELUS) Program. and the Intelligent Transportation Systems (ITS) Resource Center at NJIT, Dr. Spasovic holds a doctoral degree in systems engineering from The University of Pennsylvania, a master of science in civil engineering from the University of Maryland at College Park, and a diploma in transportation engineering from University of Belgrade, Serbia.

15TH ANNUAL NJDOT RESEARCH SHOWCASE
RESEARCH PARTNERS

Cambridge Systematics
Lehigh University
New Jersey Institute of Technology
Princeton University
Richard Stockton College
Rowan University
Rutgers, The State University of New Jersey
Stevens Institute of Technology
The College of New Jersey

Members of the CAIT Consortium

Rutgers, The State University of New Jersey*
Columbia University
New Jersey Institute of Technology
Princeton University
University of Delaware
University of Texas at El Paso
University of Virginia
Utah State University
Virginia Polytechnic Institute and State University

Members of the UTRC Consortium

City University of New York*
Clarkson University
Columbia University
Cornell University
Hofstra University
New Jersey Institute of Technology
New York University
Polytechnic Institute of NYU
Rensselaer Polytechnic Institute
Rochester Institute of Technology
Rowan University
Rutgers, The State University of New Jersey*
The State University of New York
Stevens Institute of Technology
Syracuse University
The College of New Jersey
University of Puerto Rico–Mayagüez

USDOT University Transportation Centers

RUTGERS

Center for Advanced Infrastructure
and Transportation

New Jersey Local Technical Assistance Program (NJ LTAP)
Rutgers, The State University of New Jersey
100 Brett Road
Piscataway, NJ 08854-8058
P 848-445-3112 • F 732-445-5636

cait.rutgers.edu/njltap

The 15th Annual NJDOT Research Showcase is moderated by the New Jersey Local Technical Assistance Program (NJ LTAP) at Rutgers' Center for Advanced Infrastructure and Transportation (CAIT), and is sponsored by the NJDOT Bureau of Research and the Federal Highway Administration.